

In re Application of: Hanan KEREN et al
Serial No.: 10/556,483
Filed: November 14, 2005
Office Action Mailing Date: October 6, 2009

Examiner: Patricia C. MALLARI
Group Art Unit: 3735
Attorney Docket: 30811
Confirmation No. 3797

REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks following is respectfully requested.

Claims 75, 77-105, 107-117 and 119-145 are in this Application. Claims 78, 85-87, 108 and 117-145 have been withdrawn from consideration. Claims 75-77, 79-84, 88-107 and 109-116 have been rejected. Claims 1-74 have been canceled in a previous response. Claims 76, 106 and 118 have been canceled herewith. Claims 75, 77, 81, 92, 93, 94, 95, 96, 103, 104, 105, 107, 115, 116, 117, 119, 144 and 145 have been amended herewith.

Claim Objections

The Examiner objects to claims 92, 96 and 105. In claim 92, the first occurrence of "to" has been deleted; in claim 96, "being" has been replaced with "are"; and in claim 105, "further" has been inserted before "comprising." In view of the amendments to claims 92, 96 and 105, withdrawal of the objections are respectfully requested.

35 U.S.C. § 112 Rejections

Claims 75-77, 79-84, 88-107, 109-116 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states that the metes and bounds of "substantially increase," "substantially larger" and "substantially constant sensitivity" are unclear.

While traversing the Examiner's rejection and in good faith for further prosecution, Applicants have deleted the word "substantially" from the claims, thereby rendering moot the Examiner's 112 rejection.

35 U.S.C. § 102 Rejections

Claims 75, 79, 80, 88-96, 101, 102, 105, 109 and 110 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Ruben *et al.*, and Claims 75, 89-97, 101 and 105 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Heethaar *et al.*

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The Examiner identifies in Ruben *et al.* and Heethaar *et al.* all the elements of independent claims 75 and 105, including the radiofrequency generator, electrodes, mixer and circuitry, and state that the feature "so as to substantially increase a signal-to-noise ratio of a remaining portion of said mixed radiofrequency signal" cannot be relied upon.

The Examiner's rejection is respectfully traversed. Claims 75 and 105 have been amended to include the feature that the mixed signal includes a radiofrequency sum and a radiofrequency difference, found in previous claims 76 and 106, and to delete the phrase "so as to substantially increase a signal-to-noise ratio of a remaining portion of said mixed radiofrequency signal." It is submitted that the amendment is not narrowing in scope.

The following remarks relate primarily to the independent claims. The dependent claims are patentable at least by virtue of their dependency on their parent claims.

The claims before the Examiner are directed to a system and apparatus for measuring blood flow in an organ of a subject. Output radiofrequency signals are transmitted to the organ and input radiofrequency signals are sensed from the organ. The output and input signals are mixed to provide a mixed signal having a radiofrequency sum and a radiofrequency difference and being indicative of the blood flow. A portion of the mixed radiofrequency signal is filtered.

Ruben *et al.* teaches a technique for noninvasive determination of hematocrit. Impedance of blood is measured via application of stimulation and sensor electrodes to the finger of the patient. The stimulation electrodes are driven with an alternating voltage over a range of frequencies. The sensed voltage signals are amplified, converted to the digital domain, and then demodulated into two complex waveforms which are processed by a microcomputer to determine the tissue impedance scan indicia. Then, the blood volume is altered by a pressure cuff and another tissue impedance scan is made. The two tissue scans at two different blood volumes are used to determine a blood impedance scan. The impedance of the whole blood is separated from the total impedance and correlated to hematocrit.

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Heethaar *et al.* teaches apparatus for non-invasive measurement of a biological parameter concerning a bodily fluid. A pair of input electrodes is used for feeding a measuring alternating current to the part of the body and a measuring pair of electrodes is used for measuring the voltage. A current source provides the measuring alternating current, and a converter transforms the measuring voltage into a bio-impedance signal. The current source generates a measuring current having constant amplitude on a low frequency of 1-64 kHz and a high frequency of 32-2000 kHz.

None of Ruben *et al.* and Heethaar *et al.*, however, teaches mixing the output and input signals to provide a mixed signal having a radiofrequency sum and a radiofrequency difference, and filtering of a portion of the mixed radiofrequency signal.

It is therefore submitted that the claims are neither anticipated nor rendered obvious by any of Ruben *et al.* and Heethaar *et al.*

35 U.S.C. § 103 Rejections

Claims 75, 81, 105 and 111 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kubicek *et al.* in view of Ruben *et al.*, and claims 75 and 105 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Djordjevich *et al.* in view of Kubicek *et al.* and Ruben *et al.* The Examiner acknowledges that Kubicek *et al.* is silent as to the frequency of the output electrical signals and electronic circuitry for filtering out a portion of the mixed signal, but maintains that Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use the frequency of the signals of Ruben as that of Kubicek, since Kubicek teaches inputting signals to a body for measuring impedance and Ruben describes a frequency of a signal suitable for measuring such impedance.

The Examiner's rejection is respectfully traversed. Ruben *et al.* does not provide what Kubicek *et al.* lacks, and the combination of Kubicek and Ruben does not provide what Djordjevich *et al.* In particular, none of Kubicek, Ruben and Djordjevich teaches mixing the output and input signals to provide a mixed signal

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having a radiofrequency sum and a radiofrequency difference, and filtering of a portion of the mixed radiofrequency signal.

It is therefore submitted that claims 75 and 105, as well as claims 81 and 111 which depend therefore are not rendered obvious by any of Kubicek *et al.*, Ruben *et al.* and Djordjevich *et al.*

Allowable Subject Matter

The subject matter of claims 76, 77, 106 and 107 is deemed allowable. Claims 75 and 105, which now include the features of claims 76 and 106, respectively, are therefore submitted to be patentable.

Examination of Generic and Non-Elected Claims

In view of the amendments made to the claims and the arguments recited herein it is believed that the claims are allowable with respect to the elected species and hence examination of claims 75 and 105 in their generic context and with respect to all the species recited therein, as well as examination of claims 78, 85-87 and 108 is respectfully requested.

Rejoinder

It is noted that claim 117 includes all the allowable features of claims 75 and 105. A rejoinder of claim 117 and its dependent claims 119-145 in accordance with 37 CFR 1.104 is respectfully requested once claims 75 and 105 are allowed.

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In view of the above amendments and remarks it is respectfully submitted that claims 75, 77-105, 107-117 and 119-145 are now in condition for allowance. A prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,

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